

Let the Sun Shine In!

Synopsis

Students will observe that muddy water blocks sunlight. They will consider ways that soil might get into water and make inferences about its effects on underwater grasses, crabs, and other animals. They will dramatize connections between the sun, the earth, and eelgrass; and between people on land and blue crabs in an eelgrass environment.

Background

When sediment from soil erosion enters the Chesapeake Bay and its tributaries, it blocks sunlight that eelgrass and other submerged aquatic plants need. Without these underwater plants, young aquatic animals lack protective habitat and sufficient dissolved oxygen. Some erosion occurs naturally, especially during severe storms; however, conserving trees and other rooted plants on land can help control much erosion.

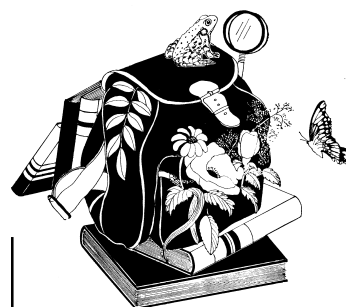
Procedure (approx. 45 min.)

1. Show crab shells, seahorse, artificial eelgrass. Students discuss the value of eelgrass as habitat for crabs, seahorses, etc. If you were a little blue crab or little fish, why would you be happy to have eelgrass nearby? (as a hiding place, as a source of oxygen) (5 minutes)
2. Show jar of clear, clean water and jar of muddy water. How does river or Chesapeake Bay water become muddy? What problem could muddy water be to fish, or clams, or oysters? Can sunlight shine through both kinds of water? Demonstrate in darkened room using flashlight projecting through clean water onto wall and not passing through muddy water. In which kind of water would underwater green plants grow better? Why? (10 minutes)
3. Pass out costumes/props for play. Narrate and direct action of play. (15 minutes)
4. Pass out craft materials. Students assemble a paper collage of a blue crab in an eelgrass environment with sun overhead. (15 minutes)

Assessment

Pause at the conclusion of the play to ask:

- u "Why are no more blue crabs or young fish left in our play?" *The jimmy crab and the big fish ate them.*
- u "Why could the jimmy crab and big fish find the blue crabs and young fish so easily?" *The eelgrass died.*
- u "Why?" *The sunshine did not go through the water.*
- u "Why?" *Soil made the water muddy and light does not pass through muddy water.*
- u "Is soil bad?" *No, soil is valuable on land. Soil was knocked off the land by the wind and rain.*
- u "Are wind and rain bad?" *No, plants on land need rain water.*
- u "How did the soil become loose, so that the natural wind and rain could take it into the water?" *People removed trees, dug up grass, and pulled up flowers by their roots. Roots could no longer hold soil securely on the land!*



Grade Level: 1

Science SOLs:
1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8

Materials:

- p 1 jar of clean water
- p 1 jar of muddy water
- p flashlight with batteries
- p 1 bunch of artificial eelgrass
- p 2 shells of blue crabs
- p 1 dried seahorse specimen
- p 3 stuffed animal blue crabs
- p 1 small stuffed animal fish
- p 1 t-shirt imprinted with blue crab image
- p 1 t-shirt imprinted with large fish image
- p 2 tree branches
- p 1 bunch of artificial flowers
- p 2 green mats rep. lawn grass
- p 1 yellow painted "sun" shape on poster board or wood
- p 7 eelgrass costumes, made of blue felt and green ribbons
- p 8 brown cloth rectangles
- p 1 blue paper blue crab shape per student
- p 1 yellow paper, ~3" square, (~1/12th of standard construction paper) per student.
- p 8 green paper strips, ~3/4" x 9", (16 strips cut from ea. std. construction paper) per student

Objectives:

1. Observe light blocking effect of soil in water.
2. Observe blue crab shells (or sheds).
3. Model blue crab and fish behavior in eelgrass; model the sun giving light to eelgrass.
4. Infer effects of muddy water on Bay habitats.

(continued back side)

Students will be able to construct the collage showing eelgrass providing protection for a blue crab and answer questions about how the parts of the collage relate to each other. For example:

u "Why do you need to include an image of the sun?" *To show that eelgrass needs sunlight.*

u "Why do you need to include images of eelgrass?" *To show that blue crabs need eelgrass for protection.*

Follow-up Suggestions

u Plant and care for grass, ground cover, flowers, trees, or shrubs.

u Mix different materials with water. See which mixtures allow light to pass through.

u Place some potted plants in light and others in dark. Observe.

u Read *Crabby & Nabby - A Tale of Two Blue Crabs* by Suzanne Tate.

5. Assemble a collage, placing a crab in its habitat.

Vocabulary Words:

eelgrass

erosion

LET THE SUN SHINE IN - Script & Directions

* "Soil was secure on the land . . . (Characters stand in two lines facing each other across the space representing water.)

* . . . because flowers and grass and trees were growing on the land" (These characters each stand behind a soil character with one hand holding a prop and the other hand on a soil character's shoulder.)

* "The sun was shining through the water of the Chesapeake Bay and on the trees, grass, and flowers on the land, making them warm." (Character stands in front of a window facing other characters.)

* "Eelgrass was growing under the water of the Chesapeake Bay" (Characters form circle holding hands in center of area representing water.)

* "Blue crabs were hiding in the eelgrass." (Characters crouch inside the eelgrass circle.)

* "Young Fish were hiding in the eelgrass." (Character crouches inside the eelgrass circle.)

* "Big 'ole Jimmy Crab couldn't find soft crabs or fish to eat." (Character enters walking sideways; pinches the eelgrass ribbons; pretends not to see blue crabs or young fish.)

* "Big Fish couldn't find soft crabs or fish to eat." (Character enters with swimming motion; circles the outside of the eelgrass circle; pretends not to see blue crabs or young fish.)

* "People came and chopped down trees; scraped up grass; pulled up flowers." (Character models tree chopping with imaginary ax or chain saw, digging up grass with imaginary shovel, pulling up flowers by the roots. Tree, flower, and grass characters return to desks.)

* "Soil got loose; rain mixed with it. It became mud and slid into the water." (Soil characters wiggle; walk slowly into water area; then form circle around the eelgrass circle, facing outward.)

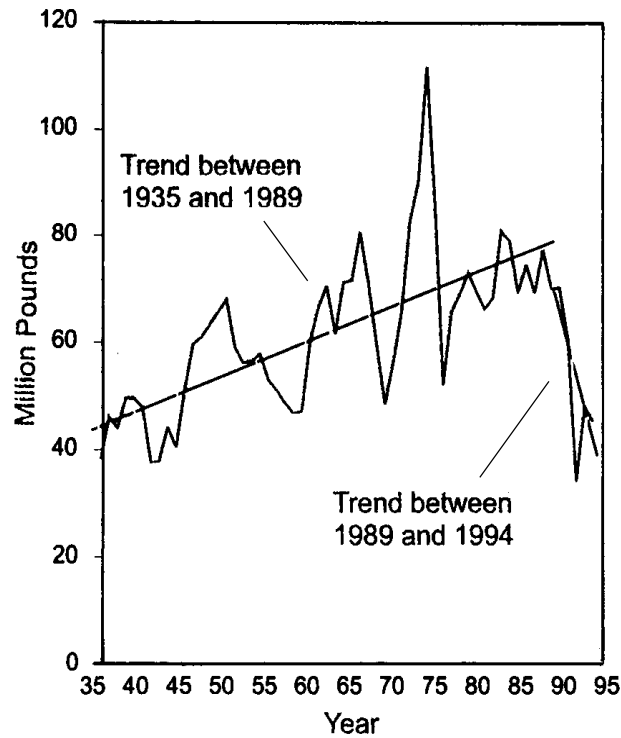
* "Sunlight could not get through the muddy water to the eelgrass, so the eelgrass died." (Sun character walks toward each soil character; each soil character blocks sun's passage. Eelgrass characters drop hands; then slowly sink down.)

* "Now the crabs and fish have no place to hide."

* "Will the big, hungry Jimmy Crab and Big Fish find and eat them?" (Jimmy Crab and Big Fish catch the remaining stuffed animal blue crabs and fish; then return with stuffed animals to desk.)

* "Why are no more blue crabs or fish left in our play?"

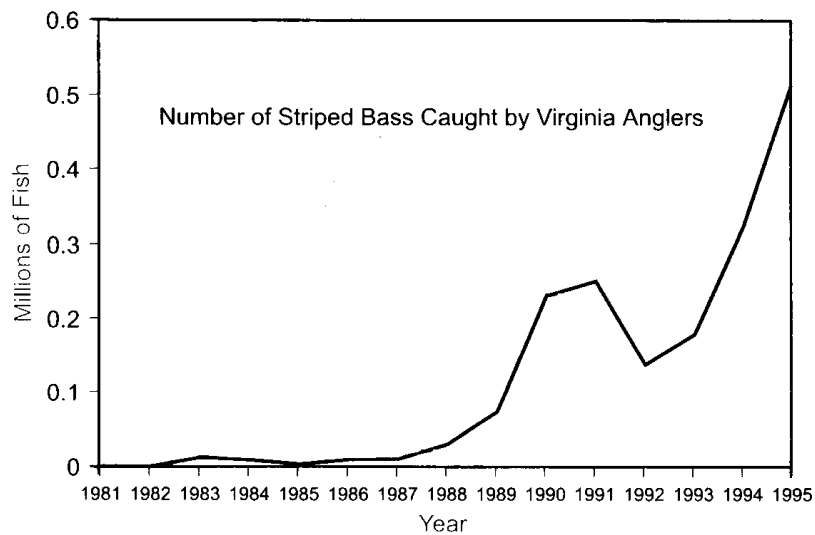
* Return costumes/props. Remaining students return to tables or desks.



Virginia Shellfish Landings

Source: Virginia Institute of Marine Science.

Recreational Fishing



Source: Virginia Institute of Marine Science.

◆ CONSERVATION ◆

Whether you live close to the shore or farther inland, you can conserve Virginia's coastal treasures. Some ways to save precious, clean water follow:

- ◆ Repair leaky faucets.
- ◆ Sweep, rather than hose down, walkways and driveways.
- ◆ Turn water off when not needed.
- ◆ Wash cars on grass surfaces.
- ◆ Maintain your septic tank in good condition.
- ◆ Plant native species in your yard. They require less water, fertilizer, and pesticides.

You can help prevent chemical and biological contamination of waterways by:

- ◆ Disposing of hazardous household wastes at special collection centers.
- ◆ Using these products sparingly and not pouring them down sinks or storm drains.
- ◆ Seeking and using safe alternatives to toxic products.
- ◆ Maintaining your septic tank in good condition.

You can help protect ocean and Chesapeake Bay wildlife by:

- ◆ Being careful to recycle or discard fishing line, nets, or other plastic debris properly in a container. Plastics that entangle or become ingested by wildlife have deadly results.
- ◆ Not putting potentially harmful substances into ditches or down storm drains.
- ◆ Learning and obeying fishing and boating regulations, which are designed to protect both people and animals.
- ◆ Planting native vegetation along the shoreline to provide food and shelter for migratory birds and a filter for water entering the Chesapeake Bay and Atlantic Ocean.